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(71) Applicant (for all designated States except US): **ECO FORCE SYSTEMS, LLC** [US/US]; 5076 South 2100 East, Holladay, UT 84117 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NORTH, Vaughn, W.** [US/US]; 5076 South 2100 East, Holladay, UT 84117 (US). **JACOBSEN, Stephen, C.** [US/US]; 274 South 1200 East, Salt Lake City, UT 84102 (US). **SMITH, Fraser, M.** [US/US]; 2458 Promontory Drive, Salt Lake City, UT 84109 (US).

(74) Agents: **NORTH, Vaughn, W.** et al.; Thorpe, North & Western, L.L.P., P.O. Box 1219, Sandy, UT 84091-1219 (US).

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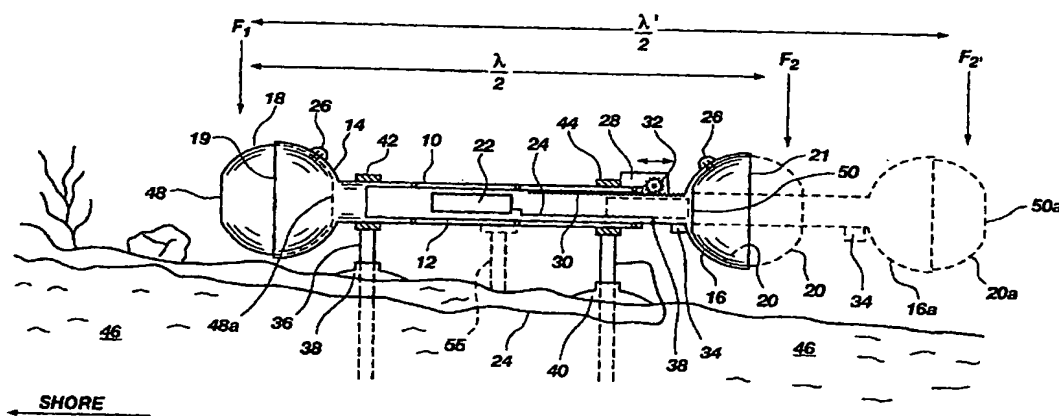
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: UNDERWATER WAVE/ENERGY TRANSDUCER



(57) Abstract: An energy transducer device for positioning at the ocean floor for converting wave action at an ocean surface above the transducer to electrical current, the device comprising a mounting base 38, 91, 106, 112, 123, 133, 143, 153, 163, and 179 configured for positioning at the ocean floor below a location of possible wave action wherein overhead wave displacement generates reciprocating water displacement along a flow path F near the ocean floor; and an electro-mechanical transducer 22, 72, 92, 100, 110, 120, 130, 140, 150, 160, 170, 180 coupled to the mounting base and configured for positioning within the flow path and responsive to the reciprocating water movement along the flow path to generate electrical current.

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41730

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F16D 31/02

US CL : 60/398

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 60/398; 290/42,43,53,54

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,291,904 B1 (CARROLL) 18 SEPTEMBER 2001 (18.09.2001) ENTIRE DOCUMENT.	1-6,10-12,14,17
X	US 5,844,323 A (HUNG) 01 DECEMBER 1998 (01.12.1998) ENTIRE DOCUMENT.	1,2,7,10,14-17
X	US 4,145,882 A (THORSHEIM) 27 MARCH 1979 (27.03.1979), ENTIRE DOCUMENT.	1-3,11,12,14,17
X	US 4,748,808 A (HILL) 07 JUNE 1988 (07.06.1988), ENTIRE DOCUMENT.	1,2,10,14,15,17
X	US 4,850,190 A (PITTS) 25 JULY 1989 (25.07.1989), ENTIRE DOCUMENT.	1,2,10,14,15,17

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

08 December 2004 (08.12.2004)

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02 JUN 2005

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Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

F. Daniel Lopez

Telephone No. (703) 308-0861

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/41730

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 8 and 9  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
Claim 8 wasn't searched, since it depends from itself, and claim 9 wasn't searched, because it depends from claim 8.
3. ☐ Claim Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐  
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

PCT/US03/41730

### BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

Species I is shown in Fig. 1, as having an impeller; species II is shown in Fig. 5, as having a linearly moving plate; species III is shown in Fig. 8, as having a rotary moving plate; species IV is shown in Fig. 9, as having an anemometer; species V is shown in Fig. 10, as having an anemometer; and species VI is shown in Fig. 15a-15d, as having a drag body attached to a rotatable platform.

The claims are deemed to correspond to the species listed above in the following manner:

Claims 1, 2 and 11-13 refer to specie I; claims 4-6 refer to specie II; claim 8 refers to specie III; claim 9 refers to specie IV; claims 10 and 15 refer to specie V; claims 10 and 16 refer to specie VI

The following claim(s) are generic: 1, 14 and 17, to all species; claim 7 is generic to species III and IV.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: the common technical features of claims 1, 7, 14, and 17, are disclosed by either Hill (US 4,748,808) or Pitts (4,850,190). Hill discloses an energy transducer device comprising a mounting base (17) positioned on the ocean floor; and an electro-mechanical transducer positioned within the flow path and responsive to reciprocating water movement along the flow path, to generate electrical current (by 19); wherein the electro-mechanical transducer includes a plate (10) rotatable about an axis.